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Notes Following a Visit to U.S.A. and Canada, October, 1943—April, 1944*

by

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CONTAGIOUS ABORTION (*Continued*):

In many of the laboratories visited research work continues on vaccination for abortion and related subjects.

At Berkeley, California, a good deal of work has been done on dissociation. Dr. Braun is doing this work under Haring's direction. In order to be able to express a degree of dissociation which can be used for comparison of strains, etc., he takes the percentage of dissociation after growth for ten days in broth *p*H 6·8 as his standard. He is attempting to elaborate a colorometric test for dissociation which consists in adding 1/10 c.c. trypoflavine to the broth culture; cultures of "smooths" give a cloudy appearance and this varies to clear with "roughs."

If cultures are transferred each day to fresh broth no dissociation occurs, which suggests that either a metabolite or some deficiency in the broth after growth encourages dissociation. The evidence suggests it is not a deficiency.

The effect of vitamin A on abortus infection was studied in cattle but the weight of experimental infection given was too great and the experiment was not successful. However, estimates of various constituents in the blood have been made, *e.g.*, carotinoid, vitamin A, vitamin C, phosphatase, haemoglobin, etc. These are being correlated with each other and with agglutination response but the work is not yet complete. It has been noted that infection is associated with a notable drop in vitamin A content.

At E. Lansing, Michigan, Huddleson is engaged exclusively on work on brucella. He is working on a dead vaccine prepared from *Br. suis* as his results lead him to believe that a dead vaccine prepared from the more virulent organisms gives more promise. He is also preparing a diagnostic particularly for use in the human subject and in pigs; this is a protein nucleate and so far the results are fairly satisfactory when used for an intradermal test.

At Pennsylvania College, Stubbs and Live are also working on a skin test for abortion.

In Maryland some work has been done on intradermal injection of the vaccine; 0·5 c.c. of the usual vaccine is used. No infection experiments have been carried out and while the results in herds in which the method has been used are good, there is no evidence that the method has any real advantage over the normal subcutaneous method. Rabstein, who has done most of the field work, has tested the cattle after vaccination by the opsonocytophagic test which it is claimed gives a good indication of immunity. Positive results are maintained after the agglutination response is no longer evidenced. Positive response to the opsonocytophagic test and the continued absence of abortion in the herds in which it had been used are the only evidence of the value of this intradermal vaccination and from discussion with several workers it appears that the test is not very reliable; nevertheless it may be worth while to attempt to correlate the results of agglutination test, opsonocytophagic test and resistance as judged by an exposure experiment in vaccinates, and similarly to correlate the two tests in naturally infected animals. This might be of value for experimental purposes but the test is too elaborate for general use. If it is considered that the reduction in the amount of vaccine from 5 c.c. to 0·5 c.c. and a consequent reduction of the total amount of vaccine required to be produced is important, it may be worth while investigating the value of intradermal vaccination.

A good deal of work has also been done by several laboratories, including commercial laboratories, on methods of preservation of the vaccine, transport, etc. The life given to the vaccine in America is six months. In some of the conditions under which it is used the length of life given to it is of little importance, although practitioners usually have refrigerators, but they do carry the vaccine in the boot of the car and many times the temperature there must be extremely high. In any case, consignments of vaccine tested at Berkeley, California, well before the expiry date show a viability which is too low for practical purposes and there is little doubt that this factor has contributed in producing some of the poor results with calf vaccination. The most promising contribution to the important difficulty of maintaining the activity of the vaccine comes from a commercial firm, Sharp and Dohm, who have produced a dried vaccine which can be reconstituted for use. It was not possible to obtain the actual method. One batch of vaccine tested at Beltsville when over 18 months old showed a satisfactory viability.

BRUCELLOSIS OF SWINE

This infection is found throughout the pig rearing areas. It has one or two differences from the disease in cattle. The most important is that it is extremely difficult to find all infected pigs by the agglutination test and the infection appears to proceed through a herd in spite of removal of reactors. This has been accounted for by the fact that agglutinins are not produced rapidly after infection. Some workers have had better results by testing pigs intradermally with a protein nucleate prepared from *Br. suis* but much work must still be done on this test. Another difference is that boars become infected in the testes and the genital tract generally and an infected boar will readily introduce the disease to a herd. Infection has been produced experimentally by six different routes including the vaginal.

The organism is much more virulent for man than the *Br. abortus* of cattle and a great deal of undulant fever in the States arises from infection with this organism—this is especially true of infection arising in workers in packing plants and such places. This is a likely explanation of the apparently higher incidence of undulant fever in the U.S.A. compared to this country.

MASTITIS

There is no official scheme for the control of mastitis in cattle. The incidence is high and does not appear to vary much between comparable areas in America and Great Britain. In Illinois, for instance, in the area surveyed by Dr. Robert Graham and his co-workers, an incidence varying from 13 to 77 per cent. infection (averaging 44 per cent. of the cows in the herds) was found. Infection was judged by microscopic examination of the milk.

The same types of infection are seen, *Str. agalactiae* being the chief infective agent, with other streps, staphylococci, coli and *C. pyogenes* (occasionally) in evidence.

On some of the farms visited where mastitis was discussed the farmers showed a poor realisation of the dangers of mastitis and very little knowledge of managing the herds with a view to preventing this disease.

Practitioners are using many of the substances for udder injection which have been reported upon from the States from time to time and good results were claimed for every one of them at one time or another. The most popular is a sulphonamide in oil or acriflavine. Research work is proceeding with many different substances and the results claimed for them vary considerably. No new methods of treatment were seen.

In the field the officials try to persuade farmers to adopt methods of management and milking which will prevent the spread of the condition. A method of quick milking with the machine was seen in Minnesota and Wisconsin. This method has been developed and encouraged by Dr. Petersen of the Dairy Husbandry Department of Minnesota University. Dr. Petersen believes that trauma plays a big part in the aetiology of mastitis including even the slight injury caused by the teat cup on the teat near the sinus, which arises particularly when the machine is left on the udder after the milk flow has ceased. The method followed is that two men use three milking units. One man works the units and the other strips the cows and carries the milk. The udders are massaged with cloths wrung out of warm hypochlorite solution not earlier than a minute before the machine is applied (this is said by reflex action to stimulate the secretion of a hormone which induces the cow to "let down the milk"). After using the strip cup the machine is applied for a timed three minutes. Udders

*Embodying the substance of addresses delivered at meetings of the following Divisions, N.V.M.A.: North of Scotland, Western Counties, Derbyshire, Eastern Counties, Scottish Metropolitan and Ayrshire.

are stripped and each teat is "cupped" in hypochlorite solution. A trolly is used in the milking passage on which are three egg-timers to time application of the machine, and four buckets, one for clean and one for dirty cloths, one with hypochlorite solution for teat cups and one for water for teat cups. Petersen says that in practice no stripping is necessary; in one of the herds which I saw milked by this routine, stripping was done but very little milk was obtained on stripping. The change to quick milking was made overnight and the cows very quickly adapted themselves to the new routine and there was no evidence of a reduction in milk supply; indeed the records showed that the quantity of milk was slightly higher in a short time. No mastitis has been seen in this particular herd since quick milking has been used but it did not have a bad mastitis history previously. Dr. Petersen spoke on this subject at Cornell University and his paper will probably be published in the *Cornell Veterinarian*.

It is generally held that methods of management and hygienic measures go far to control the disease and that treatment is merely an adjunct to these measures. Professor Udall, of Cornell University, stresses this point particularly. The methods of management, etc., recommended closely follow our own recommendations.

The methods of treatment which have been tried in the States are sulphonamides in oil (usually homogenised), gramicidin (or tyrothricin), acriflavine, iodine in oil, and novoxil. Good results have been claimed by workers for each of these methods. The best results reported are given with sulphonamides in oil, gramicidin and acriflavine, but where there is already a definite fibrosis in udder tissue the results are not satisfactory. For novoxil it is claimed that it is somewhat too irritant for treatment of cases which might respond to the other treatments mentioned, but that good results can be obtained with novoxil in cases where fibrosis is already present and the irritant effects of the drug are therefore not of such consequence. In California, Dr. Schalm has carried out a great deal of work on mastitis and he uses gramicidin for cases which show no udder fibrosis and novoxil for others. One injection of 10 c.c. of novoxil when the cow is dry is the method of choice; he claims that with novoxil treatment cases show a reduction in the fibrosis. A great deal of this work is not yet completed and will be reported in due course. Miller and Heishman from Beltsville, and Andberg and Weirether from Minnesota have published on their work.

Toxoid has been used for staphylococcic mastitis. Heishman at Beltsville is working on this and he finds that really acute cases do not respond; the work is not yet complete. Work has been commenced at Beltsville on a vaccine for *C. pyogenes* mastitis.

The diagnosis of mastitis was discussed with several workers. Diagnosis should be based on a combination of clinical, chemical and bacteriological findings, and it is generally agreed that the veterinarian dealing with the case must decide on the treatment.

Trichomoniasis

This condition was encountered in many areas and it is quite probable that the disease is more widespread than is at present realised.

In Minnesota, Wisconsin, and in the dairy States generally the disease is definitely present and in some localities is a serious problem. However, it is not looked upon as a disease which is difficult to control within a herd.

The conception of the disease and its methods of spread agrees closely with our own. In Wisconsin infection reached herds which were being bred artificially from a bull which was infected, and this observation is an important one, being the only case of the kind recorded. It confirms the need to require an examination for trichomoniasis in bulls for artificial insemination units.

In all localities where trichomoniasis was discussed the treatment of cows by uterine irrigation is usually not undertaken. A breeding rest of at least two months is looked upon as sufficient and in practice disease has been controlled within herds by this simple procedure alone. Infected bulls are not destroyed but their use is confined to previously infected cows. Artificial insemination is also strongly recommended as a method of control.

Research is proceeding actively on trichomoniasis in several centres, notably in Wisconsin and at Beltsville. Morgan, of Wisconsin, has developed methods of culture which he uses as a part of his method of diagnosis in bulls and he claims good results. Material is obtained from the prepuce by inserting a swab which has been soaked in amniotic fluid through a sterile glass tube inserted into the prepuce. The subject was discussed at length with Drs. Dikmans, Bartlett and Boughton at Beltsville. Their results agree mainly with the work which has been recorded from this country, notably by Robertson and Kerr. They do not see vaginitis as recorded from here and I believe they have read the description as if vaginitis was all but a constant symptom, which is far from the case and has not been claimed. They have done a great deal of useful work on diagnosis. Diagnosis in the female presents little difficulty, particularly in heifers, but it is regarded by them, as by us, as impossible to diagnose accurately in every animal although a sufficient accuracy can always be achieved to get a herd diagnosis and to know how to proceed towards control. Their method in females is to take up 7 c.c. of saline into a glass tube with a rubber bulb at one end: the tube is inserted into the vagina and the bulb pressed and released until a good sample of washings from the vaginal mucosa has been obtained. This is set aside to settle for an hour and the layer of material immediately above any deposit of solids is taken up in a pipette and is found to be the best for examination. Their work shows that a good measure of resistance to infection results after first infection. A heifer will apparently fail to conceive (she has probably aborted) and the trichomonad can be found in a vaginal smear, but after one or two oestral periods the organism can no longer be found in the vagina except at pro-oestrus or oestrus; in fact at that stage it is in the uterus. This animal can be bred, will conceive and carry its calf, and such animals have carried calves successfully on service by infected bulls; they usually find that after about the fourth or fifth calf there is again risk of abortion. This differs from the work done by Kerr and his colleagues but it should be noted that Dikmans, etc., have never used artificial means of infection.

For diagnosis in the bull a long glass tube with a rubber bulb is used to obtain material (the anterior end of the tube is flattened and the edges rounded); the glans is grasped with the left hand, the tube inserted with the right hand up to the glans and the tube moved in a backward and forward direction while the bulb is pressed and released. The material obtained is mixed with 7 c.c. of saline and treated as the material from the female. If this method does not succeed with a bull under suspicion a virgin heifer is served with the bull and material from the heifer obtained, at about three weeks, for examination.

Calf Diseases

Calf scour is frequently found throughout the dairying States. On many dairy farms which were visited the housing of calves was not particularly good, but the better farms had individual pens for the youngest calves and they were gradually promoted to larger pens to hold from six to twelve calves. Several farmers had arranged to feed very little milk after colostrum was no longer available but, while this did reduce the losses from scours, it is questionable whether the calves were given an adequate diet. On many of the larger farms too many calves are housed under the same roof. At one of the research stations in the South (Auburn, Alabama) calves were housed in very small shelters with a run; the whole can be moved very easily to fresh ground and there is no doubt that these calves were thriving extremely well—the system, however, would only be suitable in warm climates. In many instances there was room for improvement of housing and general management of calves.

A great deal of work has been done on calf diseases generally and in calf scours and calf pneumonia particularly. Phillips at Wisconsin has approached this problem as one which can be solved by attention to the vitamin supply for the calves and has published on his work. While there can be no doubt that vitamin deficiencies do play a considerable part in predisposing to these conditions it is questionable if adequate vitamin supply is sufficient to prevent them, particularly if conditions otherwise are not good. One worker who spoke at Chicago of his experiments on the treatment of calf scour with sulphasuxidine and sulphathaladine said quite definitely that the addition of vitamins A and C to the diet had no effect on the condition. The dosage is approximately 2 to 3 grammes per 10 lb. body weight for sulphasuxidine and 2 grammes per 10 lb. body weight for sulphathaladine. The dose is divided into three equal parts per day and continued for four or five days. Response is seen in 36 to 48 hours. At the same time feeding is reduced and sanitation improved. Of 45 cases treated with sulphasuxidine 41 responded and of 16 with sulphathaladine 15 responded. While there is an absence of controls in this work, calves dead on the same farms were examined from time to time: coliform organisms were recovered from heart, blood, and brain tissue. Examination of faeces was made regularly in the treated calves and it was suggested that the improvement may possibly be due not entirely to the reduction in the content of coliforms but to an alteration in the balance of intestinal flora since while there was a definite reduction in coliforms there was a fairly constant bacterial count. Very similar results were found at Minnesota by Dr. Roenke working under Dr. Boyd at the University, but they used sulphaguanidine.

Another method of treatment that has been used is to give the calf acidophilus milk. Brilliant green 1 in 1000 has been used with good results among calves on the Beltsville experiment station.

HOG CHOLERA (Swine Fever)

This disease presents a very serious problem in areas where pig breeding and rearing is the main form of stock farming, in Iowa, eastern Nebraska, part of Minnesota and Illinois (in the corn belt generally). It is impossible to obtain accurate figures of the losses from this cause but estimates have been made which show an interrupted fall from 140 per 1,000 in 1886 to 30 per 1,000 in 1940. The disease has swept through the Middle West from time to time, but since the use of serum and virus has been more general, there has never been such an extensive epizootic as those seen in earlier years. The disease has a definite seasonal incidence being much more prevalent in the summer and autumn. The disease is seen throughout the whole of the United States; in the southern area the seasonal incidence is not so marked and the disease is usually seen in a less acute form. In California where large amounts of unboiled swill are fed the disease is only held in check by widespread use of serum virus immunisation.

Diagnosis of hog cholera is made in the Middle West from the clinical picture, history and *post-mortem* examination but the *post-mortem* lesions are only taken as supplementary to the other findings. The following chart, prepared by Drs. Peterman and Beagle in Nebraska, gives a good indication of the points in the history and symptomatology which are considered important in diagnosis and particularly in differentiating between swine erysipelas and swine fever.

DIAGNOSIS CHART FOR SWINE ERYSIPELAS

(Check the following—Make your diagnosis)

Symptoms Characteristic of Acute Swine Erysipelas

		Yes	*No*
1.	Sudden death, either of 1 animal 3 to 10 days prior to, or of 1 or more at the onset of the herd attack	.....	.....
2.	Crisis reached quickly and of short duration	.....	.....
3.	Several sicken simultaneously	.....	.....
4.	Disinclined to move. Show pain, soreness, stiffness or trembling when aroused	.....	.....
5.	Four feet together when standing	.....	.....
6.	Unexpected vitality when aroused	.....	.....
7.	Temperatures in the herd vary from 104° to 108° or more	.....	.....
8.	Acute sickness about 1 week after being fed a carcase or offal	.....	.....
9.	Labored breathing; mucus in nostrils	.....	.....
10.	Whooping cough; vomiting	.....	.....
11.	Fair appetite in visibly sick hogs	.....	.....
12.	Eyes clear, alert	.....	.....
13.	Feces normal	.....	.....
14.	Scarlet edematous areas of skin on body, snout, ears, legs, axillary or perineal region	.....	.....
15.	Major death losses occur during initial stage of the disease	.....	.....
16.	Recovery of sick animals within 3 or 4 days	.....	.....
	Total	.....	.....

Symptoms Characteristic of Chronic Erysipelas

1.	Skin sloughing on back or shoulder limited to 1 or 2; not confined to white skin only	.....	.....
2.	Tail sloughing (after 5 to 6 weeks of age)	.....	.....
3.	Tips of ears dry, harden, later slough	.....	.....
4.	Lameness in heavy hogs	.....	.....
5.	Enlarged joints, soreness, stiffness; thickened tendon sheaths	.....	.....
6.	Loss of hair, either slight thinning or extensive; in irregular patches, or from diamond skin formations only	.....	.....
	Total	.....	.....

Symptoms Not Characteristic of Swine Erysipelas

(Characteristic of hog cholera)

1.	Loss of Appetite	.....	.....
2.	Gradual sickening; no recoveries	.....	.....
3.	Temperatures averaging 105° to 106° in all animals sick for several days	.....	.....
4.	Weak; staggering gait	.....	.....
5.	Extreme exhaustion; crossing of hind legs	.....	.....
6.	Spasmodic convulsions	.....	.....
7.	Watery diarrhea	.....	.....
8.	Gummy eyes	.....	.....
9.	Purplish discoloration of skin on animals dead or approaching death	.....	.....

(Characteristic of other diseases)

10.	Emaciation; diarrhea; appetite	.....	.....
11.	Blood in feces	.....	.....
12.	Superficial skin sloughing confined to white skin only	.....	.....
13.	Rhinitis, sneezing with distortion of nose	.....	.....
14.	Goose stepping with hind legs	.....	.....
15.	Tail sloughing on very young pigs	.....	.....
16.	Soft enlarged joints in suckling pigs	.....	.....
17.	Eczematous condition on face and body in young pigs	.....	.....
18.	Itching and scratching in young pigs	.....	.....
	Total	.....	.....

Prepared by A. G. Beagle, D.V.M.
J. E. Peterman, D.V.M.

Serum virus is used as a method of immunisation throughout the country and, properly used, there is no question about its value in markedly limiting the spread of disease. None of the officials with whom this subject was discussed believe it possible that cholera can finally be eradicated so long as this method of control is in use, for the obvious reason that the continued exhibition of virus must maintain infection. However, the number of pigs involved in areas such as the Middle West and on the swill feeding pig ranches of California (one of which was seen with a total of between 50,000 and 60,000 pigs) requires some method which will confer immediate protection and which will give a reasonably lasting immunity. The results with serum virus have been good so long as the method has been used intelligently but unfortunately it is possible for anyone to purchase the serum and virus, and indiscriminate or misguided employment of them sometimes gives rise to trouble; young store stock may be inoculated without due precaution to protect other stock from infection with the virus and one case was actually seen in Nebraska (and at the time it was difficult to find any cholera) where the breeding stock had become infected as the result of using serum virus for some pigs born in the previous autumn. In other cases it would appear that the actual inoculation had been improperly carried out by a layman who had chosen to purchase the material and use it himself. One great risk in using serum virus treatment is that it may be employed for pigs which are already affected with other conditions which may be evident only to a very skilled observer. In addition, the serum virus treatment is often used at the early stage of an actual outbreak in a herd when, if a wrong diagnosis has been made, the results are disastrous. This has frequently happened when enteritis has been diagnosed as hog cholera

In California, on a swill feeding ranch, cholera does not present a problem although raw swill is fed in quantity; all pigs are immunised with 28 c.c. serum and 5 c.c. virus and they are never reinoculated; it is obvious that there is ample opportunity for reinforcement of immunity under such a system of management.

Crystal violet vaccine has been used experimentally for some time and field results on work on this vaccine are now being completed. Dr. Coles, at Ames, Iowa, who is in charge of one of the Bureau field stations there, has recorded his work on pigs immunised by crystal violet. A proportion of the treated pigs is purchased for test when ready for market. Coles gave a description of this work, which will be published in the *Iowa Veterinarian*, and it shows about 80 per cent. protection against artificial infection. The percentage is higher if the vaccine is credited with protecting those pigs which show some response but recover from the test dose. It is of interest to note that crystal violet vaccine sent to Canada and tested there did not protect against the virus used to challenge it. As a result an experiment is now being undertaken to test out the vaccine against different strains of virus including the Canadian one; the Bureau and the Canadian laboratories are co-operating in this work. Generally it is accepted that the crystal violet vaccine gives a good immunity, but Dr. Van Es at Lincoln, Nebraska, believes that the immunity is of short duration; in experiments he carried out he was forced to conclude that the vaccine was not as efficient as serum virus treatment. Unfortunately I was unable to obtain full details of this work. All batches of vaccine prepared are tested thoroughly under Bureau supervision before issue by vaccinating pigs with varying doses of vaccine, and inoculating them and controls with virus. (Usually 1 c.c. of vaccine intradermally is included in the test and this so far is promising but an insufficient number had been done.)

In California field tests have been done by Dr. Boynton who has also included his tissue vaccine in the trials. Cutter's produce both vaccines from the same pigs. The results with these two vaccines are very similar; immunity lasts up to nine months, which is ample to cover marketing of feeding pigs but insufficient for breeding stock, and Boynton recommends revaccination of breeding stock regularly. Complete protection by both vaccines has been found in over 70 per cent. of cases with one vaccination.

The most widely made criticism of these vaccines is the fact that immediate resistance to infection is not obtained, and, in the conditions of the Middle West and even more particularly on the ranches where raw swill is fed to pigs bred and reared on the place, this is a really serious criticism, but one which probably does not apply so strongly in this country. It would be extremely difficult to change from serum virus immunisation in the States now, in view of the amount of money vested in the serum plants.

In preparing crystal violet vaccine it has been found difficult to obtain a sterile product using disodium phosphate whereas with glycerol it is possible to get a sterile product. In 35 batches produced by the two methods, six with disodium phosphate were not sterile and all the 35 prepared with glycerol were sterile. In preliminary trials of about 500 pigs vaccinated with 5 c.c. 70 showed slight upset on inoculation of virus and 73 showed severe upset and 38 died; the results were better with 5 c.c. given twice and with 10 c.c. given twice there was 100 per cent. success in a very small number tested.

Swine Erysipelas

This disease is not of great importance outside the corn belt and it is only a matter of about 15 years since it was recognised in that area. If it was present at an earlier time it was not recognised. Nowadays erysipelas is found in all forms throughout the corn belt and presents a problem in control entirely different from that in other areas. In the corn belt, where there are such large numbers of pigs, serum has been used extensively and in more recent years a live culture is also used under a co-operative experiment with the State veterinary departments and the Bureau.

Large doses of serum are given to sick pigs and the results are usually good. While I was in Iowa and Nebraska a number of pig farms were visited but no acute swine erysipelas was seen. Several farmers, however, had pigs which were obviously affected with a chronic form of the disease and these ill-thriving runts obviously represented a greater loss to the farmer than those which had died of the disease earlier. On one farm where a large number of in-pig sows were the only stock on the farm the disease was in evidence. One sow had been treated with serum (20 c.c. twice) and was showing considerable response; a few sows showed joint swellings which were accepted as evidence of erysipelas. The recommendation made was to continue the use of serum for any sows which showed symptoms, to use live culture for the litters and to have all the piglets injected if possible before they were a week old, but at the outside before they were 14 days old. Young pigs have been treated at different ages but the opinion is now quite definite that best results are obtained if the pigs are treated within the first 14 days—usually 5 c.c. of serum and ½ c.c. of live culture is given.

In Nebraska and Iowa research work is being done on the vaccination for swine erysipelas. Dr. Van Ess is doing some of this work and will publish on it at an early date.

Enteritis

Necrotic enteritis and haemorrhagic enteritis (bloody scours) are common conditions in the pig rearing areas. Cases of both were seen in Iowa and Nebraska. Necrotic enteritis as seen in Iowa was confirmed in a few ill-thriving pigs which had been retained after a more severe outbreak. The *post-mortem* examination showed no lesions outside the bowel but necrotic lesions and deposit were seen throughout the whole length of the bowel. The pigs affected are usually younger than those affected with bloody scour; diarrhoea is early evident; appetite is reasonably good but in spite of it they emaciate and growth is completely stunted. With bloody scours the pigs affected are usually older; frequently the disease appears in pigs run in the same feed lot with cattle. It is difficult to decide whether there is any real significance in this fact but some observers believe that cattle may carry the infection, whatever it is. The aetiology is obscure. Symptoms shown are passage of blood from the rectum, bloody diarrhoea, emaciation. Appetite is frequently good but the pigs emaciate. At *post-mortem* examination, lesions are confined to the large bowel which shows a more acute inflammation with plugging of glands. Lymph glands show a greyish appearance which is said to be characteristic.

Many drugs have been tried in an attempt to treat these conditions. Drug firms issue all sorts of astringent and alkaline mixtures which are not credited with much value. In the corn belt area salt treatment has recently found favour, particularly in the treatment of haemorrhagic enteritis. This consists in taking the animal off all food, removing it from the yard in which it is running, particularly if it is running with cattle, and allowing only whey or skim milk with salt at the rate of 1 lb. per five gallons, or oatmeal added to a solution of salt 1 lb. per five gallons. Good results are claimed for this treatment but what is the rationale of the treatment I was completely unable to discover.

In Minnesota University a good deal of work has been done with the sulphonamides for necrotic enteritis and good results are claimed for treatment with sulphaguanidine at the rate of 2 grammes per 10 lb. body weight the first day, followed by 1 gramme per 10 lb. body weight for a further day or two. These amounts are divided into two or three doses per day. Kernkamp and Roepke are doing this work.

A vibrio associated with swine dysentery has been described. It grows only in blood agar in an atmosphere of CO_2—added defibrinated blood helps growth. Six of eight pigs inoculated with this vibrio came down with dysentery.

Endocrines

Several research workers have used stilboestrol both to induce lactation in virgin heifers and for treatment of pyometra, retained foetal membranes and anoestrus. The results in so far as virgin heifers are concerned do not differ from the results obtained here. Fractured pelvis has been seen and in heifers I saw the same alteration in conformation was observed—the tilted pelvis.

The best results in using stilboestrol in practice are in connection with retained foetal membranes. The best practice seems to be to give two injections, one before removal of the membranes (and it is not claimed that the membranes are more readily expelled) and one after, when the undesirable after-effects are greatly reduced; no odour remains and the general health of the animal is practically unaffected, due to the quicker involution of the uterus; 25 mg. are given subcutaneously in each dose.

For other purposes mentioned the results are good in selected cases but in discussion with practitioners I gained the impression that the use of the hormone is at times indiscriminate.

Stilboestrol has also occasionally been used for treatment of trichomoniasis but the animals were not served till fourth oestrus and this rest presumably gave the desired result. One worker made the interesting suggestion that stilboestrol might be worth trying as treatment for trichomoniasis in bulls.

At Minnesota there were two animals which had the thyroids removed. They are lethargic "bullocky" cows. One has been bred successfully more than once and it is of interest to note that there was some alteration in the cow's condition while pregnant, due probably to small amount of thyroid derived from the foetal gland. Injections of stilboestrol had no effect on these animals until thyroxin was also given.

Neurolymphomatosis (Fowl Paralysis)

All types of the disease are seen in the States and no new practical measures of control were seen. It is generally agreed that, in the light of present knowledge, culling sufficiently closely to include removal of birds showing iritis is the only practical method available; this virtually means breeding from the survivors of an outbreak.

Extensive research is in hand under the direction of the Regional Poultry Research Laboratory. At the laboratory itself considerable fundamental research on the tissues of birds is proceeding to establish the normal histology and to attempt an estimate of the significance of pathological changes seen in the tissues.

Considerable progress has been made in establishing strains free from the disease but it is not yet certain that they have been established absolutely free. The work at East Lansing suggests very strongly that the disease is egg transmitted. When the station was founded ten separate lots of 1,000 eggs were purchased for hatching and fowl paralysis developed in each lot. Eggs have been inoculated and the disease transmitted. Dr. Waters, the Geneticist at Lansing, uses a survival factor which is per cent. days alive × per cent. dead × dead from fowl paralysis ÷ 10,000. He believes the time factor is important and considers this must be included in assessing the value of a strain. Deaths have been seen as late as 1,500 days.

The isolation house in which the supposedly free strain is housed is very carefully constructed. Each pen is entirely separate, even as regards ventilation, and careful disinfection and changes of clothing, etc., are made before entering.

Strain 12 (Olson's tumour) has been used and there appears to be some promise in this strain for the production of immunity. Intradermal injection of 2,000 cells from lesions of this strain has produced a marked immunity *to this strain*. A local tumour is produced and quickly regresses. So far the immunity has not been challenged by injection of material from other strains.

Experiments at Berkeley, California, proceeding under Dr. Beach and Dr. De Ome, suggested that the condition is not egg transmitted. Eggs incubated individually produced chicks which came down much later than those which had been produced from eggs incubated in the usual way. The suggestion is that there is a possibility of air-borne infection and experiments will be done with glycols in the disinfection of the air in the incubators.

Pullorum Disease

This disease is found throughout the United States. In all areas active measures are in force for its control and most of the larger concerns have been testing birds for several years. The tube test is required by several States but the majority now use the rapid whole-blood test. For this purpose the antigen is produced by the Bureau or checks are made on commercially produced antigen. Considerable progress has been made with antigen production and the one now in use is a considerable improvement on the first one issued. This is the "T.G." antigen (so called because sodium thiosulphate-glycerol is included in the medium). There are not so many pin-point reactions and generally the reaction time is quicker. A third antigen, which has been called "K" antigen, is now being tried experimentally and promises to be a still further improvement; this incorporates colloidal sulphur in the medium instead of sodium thiosulphate-glycerol.

There is an additional problem in turkeys in the U.S.A. For turkeys only the tube test is in use but the K stained antigen is on trial for testing flocks of turkeys and promises to be useful.

In Michigan an excellent method of carrying out the rapid test was seen. A folding table which holds eight or a dozen birds is used; it is fitted with hooks which pass through the table and hold the birds' legs in position (these hooks are held by a simple spring arrangement underneath) and also with rubber bands which hold the bird's body in position; one wing which is to be bled is left outside the restriction of the rubber band. This is found particularly useful when blood testing and tuberculin testing are being combined. The blood test is first done and reactors discarded and then tuberculin is injected while the birds are still under restraint on the table.

Meat Inspection

Federal meat inspection is confined to those packing houses from which meat or meat products will be exported from the State where the packing house is situated. In normal times, about 70 to 75 per cent. of meat, etc., is under inspection, but at present the figure is about 75 to 80 per cent. This increase arises because of the fact that it is a requirement of the Armed Forces that meat, etc., has passed Federal inspection. The remainder of the meat may be inspected under State or city officials but, generally speaking, plants under State and city supervision are not good nor is the standard of inspection satisfactory; however, in California State meat inspection was so good that a number of the plants now produce meat, etc., for the Armed Forces with the existing inspection; the inspectors were taken over by the Federal Government.

Inspection is of a high order in packing plants under Federal inspection. Tuberculosis is seldom seen but a routine examination of all offals is made—offals usually pass the inspector on a moving belt and there are usually two inspectors on this work. Routine incisions are made in examining livers for fluke, abscess, etc., in hearts and heads for *Cysticercus bovis*; mediastinal and bronchial glands are cut, but generally (except in the case of reactors) mesenteric glands are only palpated. In pigs the submaxillary glands are cut and routine inspection is made of offals. These inspections may be made by lay inspectors, but the final inspection of the carcase and any detained offal is always made by a veterinary surgeon.

The type of packing house is entirely different from most of our slaughterhouses. Generally, there are processing plants for sausage, spam or similar processed meat, hams, edible fats, etc. The inspectorate is responsible for seeing that all buildings, floors, walls, tables, equipment and utensils are kept in a good sanitary condition and those which were seen were certainly kept remarkably clean. The inspectorate is also responsible for the standard of tinned meats, etc.; sample tins are incubated for some time before release.

The equipment is particularly good and the workers seemed to have a very high standard of skill, although there were complaints that a number of them are poorly trained compared with those employed in pre-war years. There is far less messing of floors than under our system; animals are bled as they come along in the moving chain and hides are removed and offal is pulled out either on to a movable belt or, where there is no belt for offal, on to a trolley and dropped to containers on a lower floor through a chute.

There is no doubt that the methods employed are sound; they produce a good healthy product, but the methods of slaughter are definitely crude.

CANADA

Organisation, Etc.

In the Department of Agriculture the duties are divided into four services—Production, Science, Experimental and Farms and Markets. The Health of Animals Branch is under the Production Service and the Veterinary Laboratories are under the Science Service.

In general, the problems are similar to those in the U.S.A. but the position in regard to tuberculosis, Bang's disease and swine fever requires more detailed mention and, in addition, one or two special problems will be described.

Tuberculosis

Eradication has not progressed nearly so far as it has in America. However, the system is good and eradication proceeds in an orderly fashion by areas. Approximately 50 per cent. of cattle are now in tested herds.

There are three separate plans: (1) The Accredited Herd Plan, which aims at eradication in pure bred herds of cattle and is meant to encourage stock improvement as well as eradication. It should be noted that at present compensation is only paid after full accreditation; (2) the Supervised Herd Plan, which relates to herds of grade cattle and no compensation is paid; (3) the Restricted Area Plan, which is for the eradication of tuberculosis from herds in defined areas. A short description of the plans from a booklet on Bovine Tuberculosis gives a good idea of the general methods of working the plans.

Accredited Herd Plan

The object of this plan is the eradication of tuberculosis in pure-bred breeding herds. These herds are tuberculin tested free of charge by salaried veterinary inspectors.

To be eligible for acceptance under this plan a herd must contain at least ten pure-bred cattle of one breed registered in the applicant's name. The number of pure-breds must, however, comprise at least one-third of the total number of cattle in the herd.

As soon as the herd has passed two annual or three semi-annual tests, without a reactor, and contains at least ten registered pure-breds, it is designated a "Tuberculosis-free Accredited Herd."

Compensation paid for reactors is based on two-thirds of the valuation placed upon the animals by veterinary inspectors of the Health of Animals Division. The maximum amount of compensation permitted under the Act is $100 for pure-breds and $40 for grades. Compensation on a pure-bred basis is not paid for reacting animals over six months of age not registered at the commencement of the tuberculin test. Animals affected with lump jaw and grade bulls must be slaughtered without compensation if they react to the test. All reactors must be slaughtered under Federal inspection.

Supervised Herd Plan

The supervised herd plan is a single herd policy applicable to grade herds irrespective of the number of pure-bred or grade animals they contain. No compensation is paid for reactors, but the owners receive whatever proceeds there may be from the salvage.

Owners placing their herds under the plan must agree to slaughter reactors, to cleanse and disinfect their premises promptly, and to keep their cattle from coming in contact with untested animals. If a herd sire is not maintained on the premises, breeding operations must be restricted to a tested animal.

Restricted Area Plan

The object of this plan is the eradication of tuberculosis in definite areas. At least two-thirds of the cattle owners in any definite area must sign a petition for the establishment of such an area under this plan. This petition must be forwarded by the Provincial Minister of Agriculture to the Minister of the Dominion Department of Agriculture requesting that the necessary action be taken. The payment of compensation is based on the same limitations and maximum valuations provided under the Accredited Herd Plan.

It has been found impossible with the staff available to carry out as much testing as formerly and there are several areas now ready to be tested when there is sufficient personnel. In order to progress as much as possible, the frequency of tests in already clear areas has been reduced to the same extent as in America. This is allowing the staff to cope with some new areas, but it is undoubtedly a question of man-power which is holding up the extension of the existing free areas.

The test used is the single intradermal in the caudal fold with observation at the 96th hour only. There are cases of N.V.L. but it was impossible to obtain figures of their incidence.

The tuberculin used is produced from bovine strains and it is for the reason that the bovine tuberculin has been found to produce reactions later after injection than does tuberculin from human strains that the observation is made at the 96th hour. The real explanation is possibly that the tuberculin is less potent.

Contagious Abortion

There is some division of opinion in the value of vaccination. Only calf vaccination is allowed and so far as one could see the arrangements to enforce this restriction are adequate.

The Department of Agriculture and the Ontario Veterinary College run eradication schemes. There is no compensation for the animals slaughtered or removed from herds as reactors.

Experiments in calf and adult vaccination are still running.

Swine Fever

Outbreaks of swine fever are dealt with by slaughter and this method has succeeded in keeping the disease in check; frequently

there is difficulty in diagnosis, but the herd is maintained under strict movement restrictions until diagnosis is established.

Serum and virus treatment is, of course, prohibited. Crystal violet vaccine has found no favour, particularly in view of recent tests already mentioned. The reason for this failure was very difficult to find; in Canada the belief was that the batch of vaccine was bad, while at Ames, Iowa, it was said to have proved effective on tests. It is most unlikely that the Canadian virus differs from the American as infection reaching Canada usually comes from the bordering States which have the virulent American strain.

Shipping Fever

This condition, which is similar to our transit fever, has been a serious problem in Canada. It is accepted that the condition is caused by haemorrhagic septicaemia, but there is a strong belief that a virus is involved in the aetiology. Haemorrhagic septicaemia bacterin is used as a preventive with success. In the U.S.A., shipping fever is of less importance than it was some years ago.

It is of interest to note that Mitchell, the Director of the Laboratories in Canada, who believes a virus may play a part in the causation of shipping fever, suggests the possibility of the same or a similar virus being a causative factor in calf pneumonia.

Haematuria

In cattle, particularly in certain areas of Canada, this condition presents great difficulty to the research worker. The condition appears on one farm while a neighbouring farm with contacts has no record of a case. Healthy cows moved from a farm where the condition is common to a farm where it is not known will go down with the disease. Sick animals moved to a farm where disease is not known will not recover, nor will other cattle succumb. Attempts to cause the disease by feeding cattle on clear farms with crops from an infected farm have failed, and so far also have similar attempts using soil from infected farms.

The symptoms are usually haematuria with wasting and eventual emaciation.

The lesion seen is in the bladder. The earliest change is apparently inflammatory and there is considerable submucous haemorrhage with rupture of blood into the bladder. Healing takes place, and the lesion after this stage has all the characters of a blood tumour.

Meat Inspection

About 50 to 60 per cent. of meat, etc., is inspected by the Government staff. The system is very similar to the American one. The Government staff will only undertake the inspection in good plants where there is a kill of at least 12,000 animals.

"CARBON 13"

It is announced (says *The Times*) that with the collaboration of a group of distinguished scientists, many of whom worked on the atomic bomb, the Sun Oil Company and the Houdry Process Corporation have developed methods for the production in substantial quantities of a rare material known as Carbon 13, with which the secrets of metabolic diseases can be studied.

Experiments have already been made with Carbon 13, and although the amount of it available has been small—less probably than an ounce has been produced altogether—it is believed probable that in time it will rank in importance with X-rays as a tool of medical science, for it enables the chemist to see and follow chemical reactions in the body. The Sun Company and the Houdry Corporation are starting work at once on two plants which, when completed, will increase by 500 to 1,000 times the available supply of this heavy carbon isotype, a product of atomic research.

An announcement made jointly by officials of the two companies says: "In biochemical research Carbon 13 is used as a tracer in probing the secrets of fundamental processes that occur in all living things, as well as metabolic disease processes, of which cancer, diabetes, hardening of the arteries and so-called 'heart trouble' are examples. Indistinguishable chemically from ordinary carbon, the substance is absorbed in living tissues and undergoes the same metabolic process as does ordinary carbon. But where ordinary carbon cannot be traced as it passes through these intricate chemical reactions, which are the processes of life itself, Carbon 13 can be detected by the aid of an electrical instrument called a masspectrometer, and identified with specific bodily functions."

Carbon 13 produced in the new plants is to be made available "without cost to qualified non-commercial biological and medical research organisations whose activities and experience justify such donations."

The French Veterinary Profession Under German Occupation

The Price of Resistance

JOHN PASFIELD, M.R.C.V.S.
Horsham

Supreme Council of the Ordre des Vétérinaires

At a Council meeting held on June 21st, 1945, Dr. Degois in the chair, the first business before the Council was to congratulate Professor Petit, Director of Veterinary Studies, on his safe return from a concentration camp.

The Council remaining standing, the Secretary General, M. Bréyot, announced the following list of casualties suffered by the profession under German occupation:—

M. Lafaye. In practice at Versailles.

Lafaye was one of the earliest members of the Resistance Movement in France. He was a member of a group of university men who took part in the preparation of an underground paper directed mainly at reviving the moral courage of the intellectual groups in the country. The journal was printed in a small country house belonging to M. Lafaye just outside Versailles. The whole organisation was betrayed to the Germans. After the trial, of which the repercussions were felt in practically every scholastic circle, writers, clergy, teachers, and doctors were arrested wholesale, the majority being condemned to death. Lafaye, who was not physically strong, though morally unconquerable, was deported to Sonnenburg concentration camp where he died of pneumonia "after questioning."

M. Holstein. In practice at Versailles.

Holstein was associated with Lafaye in the Underground Movement. At the time of Lafaye's arrest Holstein removed the printing machine which was the principal evidence against Lafaye. But the information lodged against the latter was so complete that Holstein was drawn into the net and condemned to five years of forced labour. In the camp at Sonnenburg he died of scarlet fever.

M. Cruveiller. In practice at Le Bugue.

He was arrested in December, 1943, on a charge of "activity against Germany." In fact he was a member of the secret army which was in constant touch with the Maquis. M. Cruveiller was deported to Buchenwald, then to Kradisko concentration camp in the Sudetenland, where he was shot in April, 1945, a few days before its liberation by the Americans. He was 33 years of age.

M. Chanraud. In practice at Saint-Astier.

Arrested on June 7th, 1943, he was transferred in the following year to Dachau, Flossembourg, and finally to Schlakemweik, where at the age of 50 years he died of starvation.

M. Trelut. In practice at Tarbes, of which town he was Mayor.

Arrested by the Gestapo in April, 1943, he was deported to Buchenwald. From the moment of his arrival he was forced to carry out the heaviest types of manual labour. In spite of heroic efforts, and reduced to the state of a living skeleton, he at length collapsed, whereupon he was frozen with ice. He found the strength to cry "My friends, long live France," and died in March, 1945.

M. Tirtaine. Veterinary Surgeon and Doctor of Law, Mayor of Hersigny-Coupigny.

Deported to Dachau, he died on May 8th, 1945, aged 46 years, as the result of torture and starvation.

M. Le Gal. In practice at Saumur.

Arrested by the Gestapo in September, 1943, he was deported to Dora where he died of ill-treatment and starvation. Professor Petit consoled him in his dying moments.

M. Elize. Veterinary Surgeon and Mayor of Sable.

Arrested by the Gestapo, he was deported to an unknown camp in Germany where he died.

M. Bernard. In practice at Guise.

Arrested in March, 1944, by the Gestapo, he was imprisoned at Compiegne. On the way to Dachau he was stifled to death together with 65 others of the 100 Frenchmen who had been packed into the wagon. M. Bernard was head of the Resistance Movement of the district of Guise.

M. Bonnet. In practice at Clermont-en-Argonne.

Arrested by the Gestapo in July, 1944, he was deported first to Dachau, then to Dortmingen in the Black Forest, where he died as the result of his ill-treatment in October, 1944.

This was not the total of the losses suffered by the veterinary profession in France by reason of their activities for the Underground Movement. The Supreme Council listed 22 more professors and practitioners who had been deported to concentration camps in Germany, but who had succeeded by one means or another, mainly at the total expense of their physical endurance, in surviving their period of captivity.

The President of the Ordre des Vétérinaires particularly specified the case of Professor Petit, a member of Council. Marcel Petit was from the first an ardent member of the Resistance Movement. The influence which he exercised over his pupils at Toulouse was so intolerable to the occupation authorities that he was arrested by the Gestapo and transported first to Dora, then to Buchenwald.

Professor Petit, replying in the Council to the President, described what he had undergone, the insults to which he had been subjected, the manner in which he had narrowly escaped death and the sufferings of his fellow veterinary surgeons in the camps. He owed his life to M. Morel, doctor and veterinary surgeon, who was medical officer at Buchenwald, but he placed it on record that everything which had been written about the conditions in concentration camps was far less horrible than the actual facts.

This plain recital of names and of the fate of those who considered their country and their profession worth suffering for will be an example to their professional brethren in all civilised countries.

AGRICULTURAL EDUCATION IN SCOTLAND

"Though all the members of the Alness Committee, which has been considering the future of agricultural education in Scotland for nearly two years, signed the report which is published to-day, the recommendations presented are by no means unanimous," states the *Glasgow Herald* in its issue of December 21st, and continues: "There are two sets of reservations, one on the part of the Chairman himself, Lord Alness, and two colleagues, and the other by a single member of the Committee. Thus almost half of the membership of nine differ from the main report upon important aspects of the subject.

"The chief cleavage relates to the part which the universities are to play in the future of Scottish agricultural education. At present the Universities of Glasgow, Edinburgh and Aberdeen—the cities which are also the centres for the three agricultural colleges in Scotland—take degree students in agriculture. The Committee's report recommends that education for degrees and for diplomas in agriculture should be separately provided for, the degree courses to be at the universities and the diploma courses, reduced to two areas, to be at the colleges, which should be located on rural sites. Upon that general policy there is no disagreement.

"But at that stage the Committee's members diverge in their proposals. Whereas the report recommends degree courses to be concentrated at a single university, without specifying which university should be selected for the purpose, the Chairman and two of his colleagues have no desire to disturb the present arrangement under which the three universities mentioned each give facilities for degree students. This minority stands for the three-universities basis for degrees and for the three-colleges basis for the diplomas. A single member of the Committee, Mr. J. F. Duncan, on the other hand, carries the principle of concentration to the sphere of both universities and colleges.

"It will thus be seen that the differences are fundamental, and for that reason the Committee's report may not prove very helpful to the Secretary of State for Scotland and to the Government. The main report argues that it is both opportune and practicable to concentrate the degree courses at one university, which would enable a fully equipped faculty of agriculture to be established. But as they do not face the delicate task of selecting which university should be favoured, and as they do not deny that it is improbable that any two of the three universities at present engaged in agricultural teaching will be ready to forgo this branch of their activities, it is not easy to appreciate the practical nature of their proposals.

"The Alness Committee report builds upon the recommendations made in 1924 by the Constable Committee, one of whose proposals was that veterinary education in Scotland should be confined to one centre, and that Glasgow Veterinary College should be closed down. But Glasgow Veterinary College declined to allow itself to be extinguished, despite the withdrawal of Government grants that followed, and in the intervening 20 years it has produced as many qualified veterinary practitioners as any other centre in the United Kingdom. The same contradiction between recommendations and experience might easily arise in agricultural education to-day."

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Abortion in vixens on fur ranches is reported to be increasing in prevalence. Most of it is presumed to be infectious. No successful methods of prevention have been developed.—*Vet. Med.*

CLINICAL COMMUNICATION

Pericardiotomy in the Bovine

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Subject.—Twelve months old pedigree Friesian heifer.

Symptoms.—The animal was observed over the half-door of a loose-box. She appeared to be lying in a more crouched position than normal and her general demeanour was best described as "miserable." The heifer was loth to get to her feet and turning to either side caused difficulty and evidently pain. Temperature was 102·5° F.; pulse and respiration were slightly more rapid than normal. Pressure on the xyphoid cartilage elicited pain. Slight tympany was also present.

Diagnosis.—Gastritis, possibly of traumatic origin.

Treatment.—¼-pint of linseed oil was first administered followed by R:—

Pulv. nuc. vom., 10 gr.; Sod. bic., 2 drachms; Pulv. ammon. carb., ½ drachm; Pulv. zingiber, ½ drachm; one powder, t.i.d.

The animal was placed on an inclined plane and she was much improved in five days' time. After two weeks, however, the appetite became capricious, and the owner once more requested assistance. On this occasion the oedematous condition of the dewlap, with the oedema extending up the neck, with engorgement of the jugular and other superficial veins, pointed to a cardiac affection. On auscultation of the heart, very little could be heard, and tentative percussion showed the heart to be enlarged. The diagnosis now was, necessarily, traumatic pericarditis. Treatment was deemed out of the question and the possibility of performing a successful pericardiotomy was considered.

Operation.—The anaesthetic used was a 1:8 solution of chloral hydrate, 6 oz. of which were injected intravenously. No pressure was required to raise the vein, since it was sufficiently engorged already. It was found necessary to administer ½ oz. of chloroform in an open mask during the operation.

The operation site was chosen by auscultation over a rib. A T-shaped incision was made. The vertical incision, directly over the rib, was 6 in. long. The horizontal incision was also 6 in. long. The triangular flaps so formed were reflected from the thoracic wall and 3 in. of the exposed rib were removed with a hacksaw blade. The costal vessels were secured at both ends of the opening into the thorax. The heart was thus directly exposed, and, apart from enlargement of the heart itself, and increase of pericardial fluid, there were no gross pathological changes such as are seen at most autopsies of traumatic pericarditis. The pericardium was incised and reflected from the heart. No wire could be discovered as far as the hand could reach. The operation was completed by stitching the intercostal muscles together with catgut and the skin with silk. The wound was dressed with sulphanilamide powder.

Sequelae.—When seen next day it was learnt that the heifer stood up unassisted two hours after the operation and had eaten some hay. Temperature was normal, the cardiac sounds were much more evident, and the engorgement of the veins was lessened. There was no significant rise in temperature at any time. During the following week the appetite improved, and in two weeks the oedema had almost disappeared. The heart sounds were quite distinct and normal, and it was hoped a cure would result, but in four weeks' time the oedema returned, and in seven weeks after the operation the animal was slaughtered as hopeless.

Post-mortem Examination.—Unfortunately it was not possible to attend the *post-mortem* examination, but from the knacker it was learnt that there was wire "near" the heart and a "sackful" in the reticulum.

Discussion.—Several remarkable factors emerge from this operation:—

(1) The macroscopic heart-lesions were not commensurate with the extent of the oedema.

(2) From the short period of improved health, it is apparent that some benefit was derived from the operation.

(3) The anaesthetic proved to be highly satisfactory, since it was expected that the heart, over-burdened as it was, would not withstand the depressing effect of chloral hydrate.

Considering paragraphs (1) and (2) it is possible that only selected cases will prove amenable to operation. Without further experience, however, these cases cannot be recognized, so it would be interesting to hear the experiences of others in this field.

Weekly Wisdom

Change is inevitable, at once a penalty and a privilege.—John Buchan (Lord Tweedsmuir), in "Memory Hold-the-Door."

ABSTRACTS

[The Significance of the Bacteria and Protozoa of the Rumen of the bovine. Hastings, E. G. (1944.) *Bact. Rev.* **8**. 235-254.]

The most important symbiotic relation between mammal and micro-organisms to man is that found in the ruminant. The numerical superiority of ruminants over other herbivores can be attributed to two factors which are (1) that, owing to the evolution of the stomach, they can eat large quantities of food rapidly and return it to the mouth for remastication at their leisure, which is an advantage to them in their feral state; and (2) that they are able to digest a greater proportion of the carbohydrates forming the structural part of plant tissues than other herbivores. The latter process is accomplished by bacteria and this appears to be a contact phenomenon, as no free cellulose is found in the liquor of the rumen, and it is postulated that the host has the opportunity of using the compounds formed only in the form in which they are built into the microbial cell.

The food of the ruminant contains more carbohydrate, from which acids are formed by bacterial action, than proteins, from which alkaline substances are produced. The fermenting mass in the rumen therefore becomes acid and if it were not for the saliva, with a *p*H of 8·2, which is secreted in large quantities, the digesta would become so acid that further bacterial growth would cease as in silage and sauerkraut. The conditions in the rumen favour reproduction and persistance of certain protozoa and bacteria and it is postulated that the ruminant lives upon the mass of organisms that grow in the rumen. The role played by the protozoa in the biology of the rumen is not, apparently, an essential one, for sheep, from which the protozoa have been removed, have been found to digest their food as efficiently as normal controls. The numbers of protozoa in the rumen are large and it is considered possible that the protozoa and bacteria together form as much as 10 per cent. of the total volume of digesta at the peak of the digestive cycle. It is pointed out that concentrated foodstuffs in a fine state of division may short circuit the rumen, at least in part, and that any that does enter the rumen will pass through this organ more rapidly than coarse food owing to its fine state of division. This is considered to be an advantage as concentrates can pass to the abomasum and small intestine with less loss of energy induced by microbiological action in the rumen.

The hypothesis is upheld that under normal feeding conditions the flora of the rumen is relatively stable, for, it is argued, the carbohydrates, fats and proteins from different sources are all much the same; the corollary to this is that any class of nutrient will be of much the same feeding value if it produces the same crop of organisms in the rumen and consequently research into the relative value of different feeding-stuffs is redundant.

The micro-organisms are building a mass of new organic matter from the food ingested and this is done without much loss of energy and the product is probably equal to or greater than that of the original material. If the definition of digestion put forward by Cannon—that it is the process by which food eaten is transformed from its natural complex materials into a state in which it is soluble in the digestive juices—is accepted, then little if any digestion occurs in the rumen. If, on the other hand, Morrison's definition—that all changes which food undergoes within the digestive tract prepare it for absorption and use in the body—is accepted then the changes whereby cellulose is converted into bacterial substance is true digestion. The view is put forward that there is no reason to suppose that absorption occurs through the wall of the rumen, for any soluble by-product of fermentation would be used at once by the micro-organisms of the rumen before it could reach the absorbing surface. A single experiment in support of this contention is quoted in which it was found that the soluble matter of the liquor of the rumen, taken at stages throughout the digestive cycle, was found to average 1·5 per cent.; the corresponding figure for saliva is 0·9 per cent.

A. T. P.

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[Pure Milk. Bledisloe, C. B., and Wooldridge, W. R. (1945.) *Quart. Rev.* (October.) 480.]

Lord Bledisloe and Dr. Wooldridge deal with this important subject extensively in a lucid and authoritative manner, the article containing much information which is of value not only to the layman and the authorities associated with the processing and distribution of milk but also to the veterinarian. Though most, if not all, of this has been presented from time to time in professional publications, it is valuable to have it properly collated and brought under one heading. Much of the information will be found exceedingly helpful to veterinarians when speaking to professional bodies or when dealing with those who are ignorant of the problems relating to the difficulties of milk production and the need for an increased clean and safe supply.

Though the demand for this A1 priority food has increased enormously under war-time conditions the estimated consumption per head will need to be raised from its present level of 0·65 of a pint to something in the region of 1 pint before we can be quite satisfied. Before the war the level of consumption, as indicated by figures published by the League of Nations, revealed the following situation: Finland 2·46 pints per head per day, Sweden 1·41, Denmark 1·27, Norway 1·11, Switzerland 1·06, U.S.A. 1·06 to 1·11, Austria 1·0, Germany 0·72, Netherlands 0·7, Belgium 0·46, Italy 0·23. To raise our own consumption to the level of 1 pint per day would demand an increase in production of 500,000,000 gallons per year. This could be done either by raising the production per cow above the estimated average of 500 gallons per lactation, by increasing the number of milking cows by 1,000,000, or, of course, by a combination of the two. It is interesting to note that whereas in this country the estimated average yield of 500 gallons per cow per lactation is considered in many quarters to be good, the averages of many European countries were before the war much higher, *e.g.*, Denmark 700, Belgium 680, Switzerland 665 and Germany 550. Though the interest in milk as a food is, at the moment, largely a matter of propaganda, that must be maintained and increased to keep it before the public. The high nutritional qualities of milk should be made known to a greater extent and every step taken to ensure that it is safe to the consumer.

On the production side, the article deals very extensively with the significance of disease in the dairy herd, dealing individually with such diseases as tuberculosis, mastitis, abortion and sterility and making it very clear how the widespread distribution of these conditions sets a very heavy premium on milk production. The part which an enhanced veterinary service could play in increasing production is also discussed.

N. S. B.

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[Control of Intestinal Parasitism in Lambs by Winter Treatment of Ewes, as Compared with the Use of Phenothiazine in Salt in Summer. Seghetti, L., and Marsh, H. (1945.) *Amer. J. vet. Res.* **6**. 159-164.]

The authors found it necessary to obtain information on the effectiveness of anthelmintics against nematodes in sheep in eastern Montana and under the conditions of sheep-raising in that area whilst investigating the relation of intestinal parasites to the health of range sheep. The experiment they set up was designed to determine the result of ewe treatment as measured in the lambs.

A flock of 110 breeding ewes was equally divided into two lots. The ewes in Lot 1 were treated in late January with the standard dose of 25 gm. of commercial preparations of phenothiazine, but as this treatment failed to maintain a low faecal egg count until lambing time, two additional treatments were given. In early April salt containing 10 per cent. phenothiazine was made available to both Lots of animals at all times. After lambing, the sheep were moved to summer pasture upon which there had been no sheep since the preceding November. The two Lots were kept separate and phenothiazine salt was supplied to both.

The results were assessed by faecal egg counts. It was found that phenothiazine treatment in January and March failed to lower the burden of *Trichostrongylus, Ostertagia* and *Nematodirus* in May, but that 10 per cent. phenothiazine in salt equalised the worm population by August in the two Lots of ewes, one of which went to pasture in May with an average count of 590 eggs per gramme while the other went to pasture with an average of 10 e.p.g. resulting from a third treatment. The egg count of *Trichostrongylus* and *Ostertagia* in the lambs from these two Lots of ewes remained practically equal, the average counts never exceeding 125 e.p.g., although lambs from the same ewes on the same pasture in the previous year had given average counts in August and October of 1,300 and 1,440 e.p.g. respectively. Phenothiazine in salt did not appear to inhibit the development of *Nematodirus* larvae in the faeces. Lambs on phenothiazine salted pasture had an average weight of 72·6 lb. in October, while lambs in the previous year on the same, but untreated, pasture averaged 63 lb. in October.

The authors conclude that the winter treatment with phenothiazine of ewes with subclinical numbers of *Trichostrongylus, Ostertagia* and *Nematodirus* will not pay on a range where sheep will take salt freely during the spring and summer, whereas 10 per cent. phenothiazine in salt consumed at the rate of 0·8 gramme per head for lambs and ewes will not only prevent clinical nematode parasitism in the lambs but will reduce worm numbers to a minimum in the ewes.

J. N. O.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Feb. 5th, 6th and 7th.—Hampshire W.A.E.C. Conference on the Mechanization of Milk Production, at Winchester (Guildhall).

Feb. 6th.—Meeting of the Sussex Division, N.V.M.A., at Brighton (Old Ship Hotel), 2.15 p.m.

Feb. 7th.—Meeting of the Central Veterinary Society, at the Royal Veterinary College, Royal College Street, London, N.W.1, 2 p.m.

Feb. 7th.—Meeting of the Lincolnshire and District Division, N.V.M.A., at Peterborough (Angel Hotel), 2 p.m..

Feb. 14th.—Institute for the Study of Animal Behaviour. Council Meeting, 2 p.m. General Meeting, 3 p.m. At Zoological Society of London, Regent's Park, N.W.8.

Feb. 20th.—Meeting of the Section of Comparative Medicine, Royal Society of Medicine, at the Society's House, 1, Wimpole Street, London, W.1, 2.15 p.m.

Feb. 21st.—Meeting of the Southern Counties Division, N.V.M.A., at Bournemouth.

Feb. 21st.—Meeting of the South-Eastern Division, N.V.M.A., at Tonbridge (Bull Hotel), 2.30 p.m.

Mar. 2nd.—Meeting of the Society of Women Veterinary Surgeons at Birmingham (Grand Hotel), 2.30 p.m.

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PERSONAL

Dr. Fred Bullock.—Our readers will learn with much regret that Dr. Fred Bullock, Secretary and Registrar of the Royal College of Veterinary Surgeons, who recently returned to 10, Red Lion Square after a lengthy absence through ill-health, again has been compelled temporarily to relinquish his duties. Happily, specialist examination has failed to disclose any organic disease, but Dr. Bullock, who is still thoroughly run down and requires prolonged rest, is about to enter a nursing home.

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Appointments.—Mr. David Leslie Hughes, M.R.C.V.S., DIP. BACT. (LOND.), of the Agricultural Research Council's Field Station at Compton, Berks., has joined the veterinary research staff of Boots Pure Drug Co., Ltd., Thurgarton, Notts, as bacteriologist to the firm.

The Colonial Office announces the appointment, in the Colonial Veterinary Service, of Mr. P. T. Preston, B.SC., M.R.C.V.S., as Veterinary Officer, Kenya.

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"Called to the Bar."—We learn with much pleasure that Mr. Thomas Arnold Reynolds Chipperfield, B.SC. (LOND.), M.R.C.V.S., Barrister-at-Law, was "called to the Bar" at Gray's Inn on Monday last.

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Birth.—SPRATLING.—On January 25th, 1946, to Mair Eluned, wife of F. R. Spratling, White Cottage, Circuit Lane, Reading—a daughter.

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Marriage.—WILLETT—BINDLEY.—The marriage took place quietly in Hove on January 23rd, 1946, between Mr. Derek Northen Willett, M.A., M.R.C.V.S., younger son of the late Mr. R. N. Willett, and Mrs. Willett, of Haresdean, Pyecombe, Sussex, and Helen Isabelle, daughter of Captain and Mrs. Bindley, Swifts, Colmer Place, Burgess Hill.

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R.C.V.S. Council Election, June, 1946

We are informed by the Royal College that the following nominations have been received to date:—

Geo. F. Boddie (Edinburgh)—Proposer, J. W. McIntosh; Seconder, W. Nairn.

H. Burrow (Streatley)—Proposer, J. Holroyd; Seconder, G. H. Locke.

G. P. Male (Reading)—Proposer, G. H. Wooldridge; Seconder, H. W. Dawes.

A. Spicer (Oxted)—Proposer, H. W. Dawes; Seconder, T. Dalling.

W. R. Wooldridge (Stanmore)—Proposer, T. M. Mitchell; Seconder, T. Dalling.

J. G. Wright (Liverpool)—Proposer, T. M. Mitchell; Seconder, R. E. Glover.

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Stability and Security in Agriculture

PRIME MINISTER ON THE NEED FOR PLANNING

Mr. Clement Attlee, the Prime Minister, replied to the toast of His Majesty's Government at the first post-war dinner of the National Farmers' Union, which was held at the Dorchester Hotel, London, on Tuesday of last week. Mr. Geo. N. Gould, President of the N.V.M.A., was amongst the guests, who also included Viscount Addison, Secretary of State for Dominion Affairs; the Duke of Norfolk; Sir Donald Vandepeer, Permanent Secretary of the Ministry of Agriculture; Lord De La Warr; Sir Thomas Baxter, Chairman of the M.M.B.; and Mr. J. S. Dodd, President of the Association of British Chambers of Commerce.

The toast to His Majesty's Government was proposed by Mr. JAMES TURNER, President of the Union, who referred to the honour conferred on the Union by the Prime Minister and said he hoped that it could be regarded as significant of the dawn of a new future for the industry. There were, he said, two things for which they had to thank the present Government. First, the selection of Mr. Tom Williams as Minister of Agriculture, and, second, for the early declaration of a long-term policy.

They, as farmers, he continued, realized the contributions which the industry could make towards the well-being of the nation. They could help in contributing to the vital exchange which was so necessary to this country at the present time, in raising the nutritional standards of the people by growing the right types of food, and so helping in resisting disease and in contributing to full employment.

The industry, proceeded Mr. Turner, had two very urgent problems of its own. First, its real need for more rural houses and, second, its need for labour, both of which were necessary if they were to achieve full production in the national interest.

Mr. ATTLEE said he was glad to meet representatives of an industry which made so vital a contribution to the successful outcome of the war. He knew very well the strain which had to be placed on all those concerned in British agriculture and how finely they responded to the nation's need. The role which they had to play in the immediate future during this period of reconstruction was no less important.

It was a strange thing that it was only in war-time that they recognized how much they depended on the tillers of the soil. Much of the lesson learned in the years 1914-18 was forgotten in the inter-war period. It had had to be relearned and they must see that, this time, that learning stuck in the minds of the British people. They were, he was sure, all aware that one of the greatest anxieties facing not only this country but many countries was how to provide adequate food for all and to secure its just distribution.

In London the representatives of 51 nations were engaged in laying the foundation of a United Nations Organization, a work vitally necessary if we were to make secure the peace which we had won at such cost. The initial step in this direction had been taken by electing the members of the Security Council. This Council must necessarily occupy an outstanding place in the Organization, for it was through the Security Council that collective action could be taken to prevent war, or the threat of war. But, as he had stated in his speech of welcome to the Conference, prevention of aggression was not enough. They sought to lay also a positive foundation for peace by the development of social and economic well-being for all. "Political stability in the international field is not enough," proceeded the Prime Minister. "We need also financial and economic conditions which will give all people, and especially those engaged in the production of primary commodities, a feeling of security. You all know how frustrating was the uncertainty, especially of price levels, between the wars. You remember the great depression which was one of the long-term causes of the war. To-day, after five years of war, unavoidably there is widespread economic and financial instability. The economic problems of world reconstruction confronting us are formidable. They will require great and sustained effort by the United Nations to develop positive instruments for international co-operation in economic and social matters. The Social and Economic Council of the United Nations Organization has been formed, but this does not stand alone. There are various inter-governmental organizations whose exact relation to U.N.O. has yet to be worked out. These include the Bank for reconstruction and development, the International Trade Organization, the I.L.O., the Health Organization and lastly, but by no means least, the Food and Agriculture Organization.

"Agriculture is still the occupation of something like 70 per cent. of the world's population. It is by far the greatest industry in the world and it is, therefore, gratifying to know that the Food and Agriculture Organization was the first of the new organizations to come into being. It had its origin in the Conference of the United Nations at Hot Springs in the summer of 1943, to which a strong and effective delegation was sent from this country. That Conference proclaimed inspiring aims. It brought to the front the conception of the provision of adequate food for all the peoples of the world as a primary object, to be pursued by all nations in co-operation. I need hardly tell you that it will receive the full support of the Government. We hope to see it develop along lines which will make it the chief international source of scientific, social and economic information in the field of food and agriculture, so

that farmers all over the world may benefit by advanced knowledge. We hope it may be the chief international agency through which progress may be achieved towards one of the fundamental aims of the Atlantic Charter—freedom from want. We in this country have always realized that there must be, besides the machinery of organization, the driving power of the people. I am glad to know that it is proposed to establish an International Federation of Agricultural Producers in furtherance of which your President, Mr. Turner, has played so leading and energetic a part.

Elimination of Risks and Promotion of Efficiency in Farming

"I am profoundly convinced that there is no part of the economic activities of the human race that stands more in need of stability than agriculture. Those engaged in agriculture are necessarily exposed to the hazards of the weather however much we may advance in scientific knowledge. But in a world of unrestrained competition, which I should call economic anarchy, the farmer has also been exposed to fluctuations in prices which were as much outside his control as was the weather. I am convinced that to leave agriculture entirely to the mercy of unfettered market forces does not lead to efficient production. Some degree of planning is needed and in many countries plans for this purpose are being developed and put into practice. The Government fully believe in this necessity and have in many respects already taken the lead. In the agricultural policy announced on November 15th by my good colleague, the Minister of Agriculture, we proposed to give the farming community a reasonable degree of security and stability so that farmers will know where they stand in regard to prices and can make their plans for the future with greater confidence. We are carrying forward into peace-time a system of fixing prices after mutual consultation, which we hope will not only free farmers from some of the risks they experienced between the two great wars, but will be a means of promoting greater efficiency in farm practice. We desire in this to benefit the agricultural community, but you will, I am sure, agree with me that benefits carry with them obligations. If we wish to have a prosperous agricultural system we must see first that we get the full productive use of our agricultural land—that precious heritage handed down to us by our forebears—and we must also secure the maximum efficiency in the technique of production and marketing. It is a truth which cannot be too often stressed that the higher standards of life which we wish for can only come by increasing productivity both in industry and agriculture and by avoiding waste."

Mr. Attlee concluded: "I am well aware that some of the controls which are still maintained are irksome, but in present conditions they are necessary. No doubt some of them may be relaxed as world conditions improve, but beware of yielding to a clamour for relaxation of controls which may, if carried to excess, defeat the object which you have in view. We have learned, and will learn, much in the practical working out of the relationship between the State and the country's largest industry. What was done in the war was a great example of planning in a democracy. It rested on close consultation between the Government and the industry. I hope that we shall not lose the good that we drew out of the hard times of war and that we shall work together for establishing agriculture on a firmer foundation than has ever existed in the past. In my view a healthy agriculture from which farmers and farm workers alike receive the just reward of their labour is an essential element in the economy of these islands and of the Britain which will in the future, as in the past, serve not only itself but the world."

Support for the N.V.M.A. in Disease-reduction Measures

Mr. J. N. McClean, Vice-President of the Union, who proposed the toast of the guests, said that, speaking for one section of the industry at least, he was sure that they all felt that the work they had been doing throughout the war was so much more worth while now that it had the encouragement and backing of the Prime Minister. With that backing they would have increased courage in forming the organization of primary producers and it would also encourage others in other parts of the world to take part.

Mr. McClean referred to Mr. Gould's presence as the President of the N.V.M.A., and as a fellow Hampshireman, and proceeded: "The N.F.U. are very grateful for the help and support that the Association has given them and promises support to the Association in any measures designed to reduce the incidence of diseases of livestock, and to bring about reduction where possible."

Mr. McClean then referred to Dr. Wooldridge, who was also present as a guest, as not only an eminent Past President of the Association, but as an expert human nutritionist.

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The Annual Meeting

Appreciation of the Government's agricultural policy as outlined above by the Prime Minister was unanimously expressed by resolution at the annual meeting of the Union. In a telegram they sent to Mr. Attlee they also pledged the industry's "full service to the nation in building a balanced economy." The Union is to ask the Government to determine a national wage policy for all industries; also that a national conference should be held for this purpose.

Mr. Evans (Cardiganshire) urged that the Union should push forward steps to establish "disease-free" areas in connection with the eradication of tuberculosis. There was a strong desire for a move in that direction in Cardiganshire, Pembroke and Carmarthenshire.

Mr. J. W. Salter Chalker, Chairman of the Diseases of Animals Committee, said the Ministry required 75 per cent. Attested standard before establishing "disease-free" areas. Cardiganshire had 49 per cent. The Union was pushing all it could in the matter.

The Union showed its confidence in its leaders by unanimously re-electing Mr. James Turner as President and Mr. J. N. McClean as Vice-President.

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"NATIONAL POLICY NEEDED FOR ANIMAL HEALTH"

Benefits of the Panel Scheme

Further interesting correspondence, to that reproduced in our last issue, has appeared in *The Times* following the plea for the above made by the Agricultural Correspondent of that paper in the main article appearing on January 14th and published also in our columns.

Mr. J. Fawcett, Chairman of the Hampshire County Branch of the N.F.U., describes the article as being of extreme importance to the agricultural industry, and continues: "It draws attention to a serious omission in the Government's agricultural policy—namely, the absence of any programme for the maintenance and improvement of animal health. The loss through disease, besides being a personal one to the owner, is a serious one to the nation.

"I happen to be one of many farmers who have benefited from the application of the panel scheme, so can speak with experience on the excellent results achieved and of the benefit to the farming community of the country. In addition, I have, under the direction of my veterinary surgeon, eradicated tuberculosis from three home-bred herds.

"In my opinion farmers to-day are ready and willing to accept all the benefits that veterinary science can bring to us. The time is ripe for a Ministerial policy for the more effective application of veterinary science to enable farmers to improve upon the efficiency achieved during the war years, and so add a further contribution to the national well-being."

Sir William Rootes, the prominent motor manufacturer, who is also a member of the Executive Committee of the British Council and a well-known agriculturist, writes: "In this article you have certainly rightly emphasized the urgent need for some constructive planning for the control of disease in animals, and have insisted upon an announcement by the Minister as to the nature of the plans of his department for this purpose. As you say, the eradication of tuberculosis from our dairy herds may not be possible in a year or two, but that does not mean to say that no plan should be announced for its eradication over a longer period.

"It is certainly impossible to secure the recruits we need for the veterinary profession to undertake the many tasks awaiting it in the control of animal disease and the improvement of animal health generally if the Government does not make it quite clear that the State is in earnest in its endeavours to secure the desired improvement.

Veterinary Education

"You have also referred to the panel service for dairy cows, and have emphasized the necessity for its extension. I have recently returned from the United States and was greatly struck by the work carried out by members of the veterinary profession in many parts of that country. There they are given every facility for maintaining the health of the herds; they are consulted regularly and at the earliest stages in the onset of disease. Farmers to whom I spoke over there emphasized the fact that they found frequent and regular consultation with their veterinary practitioners from the point of view of maintaining the health and productivity of their herds far more valuable than calling them in solely for the treatment of disease once it is established. It is clear that the veterinary profession is pressing for similar development in this country, but this cannot be achieved without full State co-operation in so far as the basic needs of veterinary education are concerned.

"We understand that the Government will soon make a statement upon this educational question, but even so, I believe, the agricultural industry as a whole must do much more for themselves. This they can do by assisting the Veterinary Educational Trust to go forward with its plans for the advancement of veterinary research, science, and practice in all those many ways over and above the basic needs that are likely to be met by the Government."

Dr. Edward Hindle, President of the Universities Federation for Animal Welfare, writes as follows in last Saturday's issue of *The Times*: "Your Agricultural Correspondent's plea for a clear national policy can be supported on humanitarian as well as economic grounds, for every improvement in the health of farm stock and other domestic animals brings a welcome reduction of avoidable

suffering. As to how the desired result is to be reached—how many veterinary colleges there should be; what is to be their administrative connection with the universities; and who is to be responsible for granting the licence to practise—opinions differ.

"Everybody will agree that veterinary students must have the best attainable facilities for scientific and clinical training, and that they should mix as freely as possible with students in other faculties, to the mutual advantage of both types of student. Certainly one way to secure these advantages lies through the universities, but in any event the necessity for an early decision on a clear national policy designed to secure them will not be disputed."

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HEALTH FACTORS IN STOCK PRODUCTION

Addressing the W.A.E.C. conference recently held at Worcester, Mr. J. N. Ritchie, Deputy Chief Veterinary Officer, Ministry of Agriculture, first compared British and American experience relating to tuberculosis in farm animals on the lines of his addresses currently reported in *The Veterinary Record*. Mr. Ritchie added that it was likely that farming co-operation would be forthcoming when a more progressive scheme was available to exploit it. "No official scheme for tuberculosis eradication can possibly succeed without willing co-operation from the farming community." America had reached its present position by area eradication with slaughter of reactors and compensation to the farmer. Their position was so favourable that it was obvious we could learn a good deal from it. One method that commended itself here was the eradication of the disease from defined areas, because it had many advantages.

The work of supervising and testing the 20,000 attested herds in the country had now become extremely heavy and if eradication was to proceed it would be a colossal task to maintain the frequency of testing (on the average 1½ times per annum) throughout all herds. Where large numbers of herds contacting each other in a district were attested the percentage of reactors was lower because the risks of infection were less. "If we can establish tubercle-free areas, we can, after the initial stages, increase the interval after a clear test from the present 12 months to three years and thus reduce the amount of work and release staff for districts which are in need of it."

In a free area, he said, it would be much easier for herd owners who at present had to take a variety of careful precautions against neighbouring infected herds. It would also be possible to allow free inter-herd movement of cattle inside the area instead of requiring that all movements must be on the authority of a permit issued to the owner.

Referring to the achievements in the eradication of tuberculosis Mr. Ritchie said that most of the herds in Great Britain had never been tested and probably carried a high incidence of disease. Clinical cases were slaughtered to the number of approximately 15,000 each year.

There were now about 20,000 attested herds comprising about 750,000 cattle and in addition there were upwards of 140,000 cattle in T.T. herds which were not attested. In the whole country 9 per cent. of the cattle were in attested herds. In Scotland over 20 per cent. of the cattle were attested, in Wales just under 20 per cent. and in England just over 4 per cent. The percentage of cattle in attested herds at the end of September last was:—

England: Berkshire, 15·4 per cent.; Surrey, 14·1 per cent. and only two other counties with more than 10 per cent.

Wales: Carmarthen, 49·6 per cent.; Cardigan, 48·3 per cent.; Merioneth, 34·3 per cent.; Pembroke, 28·8 per cent. and two other counties over 10 per cent.

Scotland: Bute, 75·4 per cent.; Ayr, 66·3 per cent.; Kirkcudbright, 46·5 per cent.; Dumfries, 45·2 per cent.; Lanark, 43·5 per cent., with three counties over 30 per cent., three over 20 per cent., and seven over 10 per cent.

Professor T. Dalling, Director, Ministry of Agriculture Veterinary Laboratory, Weybridge, in his paper on "New Ideas on Diseases of Farm Animals," said there were many factors which influenced the health of farm animals and the results of research work were gradually showing how far they could bring them into daily practice. "To-day we give much attention to the male animal. The same cannot, however, always be said of our attitude towards the females. It may be that the future control of mastitis will involve the treatment of the udders of all the milking herd and the taking of precautions to prevent the introduction of infection into the herd which is now free from the infection." Research work on vaccines to control contagious abortion aimed at improvement, but it would be some time before they were in a position to recommend any different vaccine from that being used at present. Future studies regarding infertility in dairy cattle would have to be directed to the action of substances (hormones) which controlled the various phases of breeding and the part played by nutrition either in the male or female. "With the introduction of artificial insemination we are in the position to eliminate to a large extent the abnormalities which apply to the bull and to concentrate more on what is happening in the cow."

LEVERHULME RESEARCH FELLOWSHIPS, 1946

Application is invited for Fellowships and Grants in aid of research. The Fellowships and Grants are intended for senior workers who are prevented by routine duties or pressure of other work from carrying out research. They are limited to British-born subjects normally resident in Great Britain. In exceptional circumstances the Trustees may waive the condition as to residence. The Trustees are also prepared to consider applications from groups of workers engaged upon co-operative programmes of research, particularly from those engaged upon long-distance programmes or in institutions in which the normal facilities for research have been curtailed by the war. The duration of the awards will not normally extend over more than two years or less than three months and the amount will depend on the nature of the research and the circumstances of the applicant.

Applications must be received on or before March 1st, 1946, and forms of application may be obtained from the Secretary, Dr. L. Haden Guest, M.C., M.P., Leverhulme Research Fellowships, 7, Bedford Row, London, W.C.1.

Awards will be announced in July and will date from September 1st, 1946.

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LICENSING OF BULLS

In common with other Government statistics, information regarding bull licensing has not been published during the war years. The following particulars are now released for general information. The statement of licences issued according to the various breeds shows clearly the steady trend of interest from beef to milk production. During the last three years the number of bulls submitted for inspection has been above the pre-war level. This accords with the rise in the total cattle population.

Table I

Particulars of the Number of Applications for Bull Licences dealt with in England and Wales during the period April 1st, 1938 to March 31st, 1945

Year Ended ..	31.3.39	31.3.40	31.3.41	31.3.42	31.3.43	31.3.44	31.3.45
Bulls Licensed ..	37,175	34,191	35,347	36,555	39,508	39,816	36,403
Bulls Rejected ..	5,715	4,555	4,339	4,732	5,842	8,000	6,918
Total ..	42,890	38,746	39,686	41,287	45,350	47,816	43,321

Table II

Particulars by Breeds of Bulls Licensed in England and Wales during the Period April 1st, 1938 to March 31st, 1945

Year Ended ..	31.3.39	31.3.40	31.3.41	31.3.42	31.3.43	31.3.44	31.3.45
Aberdeen Angus ..	783	662	602	519	395	371	373
Ayrshire	554	669	696	750	1,101	1,687	2,422
Blue Albion ..	32	32	30	35	27	25	20
British Friesian ..	3,086	3,651	4,656	6,125	9,096	11,537	10,942
Devon	1,128	1,034	973	1,247	1,308	867	659
Dexter	16	16	11	30	24	14	19
Dun and Belted Galloway ..	6	11	4	5	3	5	—
Galloway	241	240	200	126	68	72	60
Gloucestershire ..	3	—	—	5	6	5	6
Guernsey ..	1,544	1,290	1,248	1,037	1,111	1,170	1,267
Hereford ..	2,351	2,119	2,242	2,191	1,524	1,286	1,201
Highland	4	—	—	1	2	7	2
Jersey	498	424	389	369	527	545	516
Kerry	14	5	7	5	8	15	10
Lincoln Red Shorthorn	1,300	1,198	1,173	1,281	1,358	1,303	1,146
Longhorn ..	5	3	5	3	2	3	2
Park	14	19	3	7	15	9	4
Red Poll	536	436	452	376	510	461	491
Shetland	2	—	1	—	5	3	1
Shorthorn ..	23,897	21,285	21,565	21,023	21,268	19,157	16,076
South Devon ..	449	487	437	694	561	819	664
Sussex	238	223	211	231	155	123	105
Welsh Black ..	440	361	353	455	410	310	323
Crossbred ..	34	25	29	40	34	22	14
Total ..	37,175	34,191	35,347	36,555	39,508	39,816	36,403

Commenting on the above figures the Editor of the *Farmers' Weekly* says, in a recent issue: "Apart from the obvious implications of the bull licensing figures—the increase in dairy, and the drop in purely beef, sires—the report suggests that certain of our old local breeds are just slipping out of existence. The drop in the number of Blue Albion sires licensed from 32 in 1939, to 20 in 1945 (total 201 in the seven years), does not worry me much, but to find that no Dun and Belted Galloways were licensed last year (total 34), only a couple each of Highlanders (total 16), and Longhorns (23), and but four Park bulls (71), must sadden lovers of these old breeds. It is true that, in the case of Dun and Belted Galloways, a few bulls have been licensed every year from 1939 to 1945, and

presumably many of these are still in service, but for two years during the period no Gloucester, Highland or Shetland bulls were licensed. I suppose it is inevitable that these breeds, as part of the equipment of the modern farm, must be superseded, yet it will be a thousand pities if they are allowed to die out altogether. Couldn't some of our wealthier newcomers to farming help in their preservation?

"The trend of the bigger breeds is, in most cases, what one might have expected, although the figures are frequently striking. The increase in Friesian bulls licensed from 3,086 to 10,942 (total 49,093 in the seven years), and in Ayrshires from 554 to 2,422 (total 7,879) is at once an indication of our war food policy and of the popularity of these breeds. But the drop in Shorthorns from 23,897 (1939) to 16,076 (1945) is not so understandable. I am making no deductions, but the fact is that all the breeds which can be described as dual-purpose seem to have fewer bulls licensed than in 1939. Far more Shorthorns, of course, are licensed than any other breed, the seven-year total being 144,271."

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ADDRESSES OF DISEASE-INFECTED PREMISES

FOOT-AND-MOUTH DISEASE:

Brecon.—Pentwyn Farm, Lower Cwmtwrch, Ystradgynlais, Swansea, Glam. (Jan. 24th); Cefn Coed Farm Palleg, Lower Cwmtwrch, Ystradgynlais, Swansea, Glam. (Jan. 24th).

Leicestershire.—Wester's Dairy, Saxelby, Melton Mowbray, Leicestershire (Jan. 28th).

Northants.—The Elms Farm, Cosgrove, Bletchley, Bucks. (Jan. 22nd).

SWINE FEVER:

Berks.—21, Cordwallis Street, Maidenhead, Berks. (Jan. 26th).

Devon—16, North Street, Braunton, Devon (Jan. 25th).

Lincs. (*Lindsey*)—Cooper's Lane, Laceby, Grimsby, Lincs. (Jan. 26th).

Kent.—Poulder's Farm, Stourmouth, Canterbury, Kent (Jan. 23rd).

Lanarks.—Bridge Street, Cambuslang, and Millgate Piggeries, Tannockside, Uddingston, Glasgow, Lanark (Jan. 21st).

Norfolk—Manor Farm, Wendling, Dereham, Norfolk (Jan. 25th).

Northants. (*Soke of Peterborough*).—9, Long Row, Eye Green, Peterborough, Northants. (Jan. 22nd).

Rutland.—Drift Lane, Exton, Oakham, Rutland (Jan. 24th).

Surrey—45, Boscombe Road, Worcester Park, Surrey (Jan. 24th).

Warwicks.—Brickyard Field, Haunchwood Road, and The Field, Milford Street, Nuneaton, Warwicks (Jan. 23rd).

Worcs.—Sewage Farm, Hunt End, Redditch, Worcs. (Jan. 25th).

Yorks. (*W.R.*)—Low Farm, Aldborough, Boroughbridge, Yorks. (Jan. 21st).

SHEEP SCAB:

Merioneth—Bryn Llech, Festiniog, Blaenau Festiniog, Merioneth (Jan. 21st).

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office.

	Price	Post
STATUTORY RULES AND ORDERS, 1946:		
10. Milk (Special Designations) Regulations, January 2nd, 1946	0 1	0 2
COMMAND PAPERS (Session 1945-46):		
(6704.) Agricultural Education in Scotland. Committee on (Chairman: The Rt. Hon. Lord Alness, P.C.). Report. December 10th, 1945 ...	0 9	0 11
HEALTH, MINISTRY OF:		
Circular No. 218. Rural Water Supplies and Sewerage Act, 1944. December 17th, 1945 ...	0 1	0 2
Circular 10/46. Milk (Special Designations) Regulations, 1936-46. Prescribed Tests for Pasteurized Milks. January 18th, 1946 ...	0 1	0 2

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal views of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue

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NUTRITIONAL ROLE OF THE MICROFLORA OF THE ALIMENTARY TRACT

Sir,—I have been much interested in reading the report of the Nutrition Society of England which at its meeting on December 30th, 1944, considered the nutritional role of the microflora of the alimentary tract. I am sending you under separate cover a reprint of an article which reviews the significance of the micro-organisms of the rumen of the bovine. [See abstract on page 52 of this issue. —*Editor.*]

It seems to me that those speaking at the meeting have neglected to consider the biology of the rumen as a balanced system. In other words, the by-products of any organism are immediately used as food by some other type of organism and this process continues until all of the food ingested is changed into the cells of micro-organisms and into the final and simple by-products such as water and carbon dioxide, the nitrogen apparently being built almost completely into the protein of the micro-organisms.

While various acids are undoubtedly produced in the rumen they would be immediately utilised by some organism, primarily I suppose as a source of energy.

The acceptance of this view leads to the conclusion that many of the aspects of nutrition of the bovine previously emphasised by those interested in the nutrition of this type of animal are without any significance since apparently the micro-population of the rumen will not be materially changed by alterations in the type of material ingested by the animal.

Yours very truly,
E. G. HASTINGS,
Emeritus Professor of Agricultural Parasitology,
The University of Wisconsin.

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DYED GREYHOUND CASE

Sir,—Reference Mr. Robb's letter in your last issue, I am glad to have been the means of causing amusement to Mr. Robb, though what he can find in the way of comedy in a straightforward exposition of a legal case, is difficult to understand.

It might weary your readers if an attempt were made to argue the details point by point (though they certainly could be argued), but I would be quite willing to defend my opinion should there be any general desire for that course. I have an equal right with Mr. Robb to an opinion and it seems rather unfortunate for the prosecution that Mr. Robb's opinion, as advanced in court, was not acceptable to the jury.

I genuinely believe what I stated in my article, and have not as yet found a shred of evidence to discount it. But I am entirely unbiassed, and quite ready to accept any irrefutable evidence Mr. Robb may be able to produce. The various veterinary aspects of the case certainly need clearing up, for the edification of other practitioners who may be involved in similar proceedings.

Yours faithfully,
"Croyland," 658, Finchley Road, HAMILTON KIRK.
Golders Green, N.W.11.
January 25th, 1946.

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ACCOUNTS OF STEWARDSHIP

Sir,—Both Mr. Bevan and Mr. Edwards have brought up the matter of secrecy shrouding the work of the Foot-and-Mouth Disease Research Committee, and the Animal Health Division of the Ministry of Agriculture and Fisheries in your issue of December 29th, 1945, and January 19th, 1946, respectively. Now, research workers, as a whole, work hard and disinterestedly—often with little remuneration—for the furtherance of knowledge and the benefit of mankind in general. Therefore it can, I think, be assumed that they would gladly report their findings publicly, for the enlightenment of their colleagues, were they so permitted. It would appear that the disregard for the interests of the profession lies with the lay Administrative Staff of the Ministry. I base this assumption on the fact that a notice which appeared in the farming press on December 29th, 1945, *re Brucella abortus* strain 19, only arrived here in circular form, from the Ministry, on January 6th, 1946.

This is a matter of considerable importance, not only to the veterinary profession, but also to the general public, as it indicates the trend of our national life. In the White Paper on the State Medical Service it was stated that medical committees would make an annual report, but could not publish it, and if a State Veterinary Service were to come into force, no doubt the same restrictions would apply.

To what is this nation coming, if those who have knowledge are not allowed to impart it? The British people have long been envied their right to freedom of speech by the peoples of less fortunate nations. Let us see that we do not sell our birthright for a mess of pottage.

Yours faithfully,
Longside, Aberdeenshire. ROBERT W. JOHNSTON.
January 22nd, 1946.

The office of the Medical Research Council which had been accommodated during the war in the London School of Hygiene and Tropical Medicine, has reopened at 38, Old Queen Street, Westminster, S.W.1 (Whitehall 4884).